ICT and human mobility

This special edition emerged from a two-day conference on ICT held in May 2010 at the Centre of African Studies, University of Edinburgh, UK.[1] The conference title was intentionally broad – 'ICT: Africa's Revolutionary Tools for the 21st Century?' – in order to attract a wide variety of papers to satisfy Africanist delegates with an interest on ICTs in different countries/regions of the continent, and from varying fields of study. The conference succeeded in these aims, with a healthy mix of papers from both explicitly 'developmental' perspectives (including keynotes from Jonathan Donner of Microsoft Research India on the 'mobiles for development discourse', and David Souter of ict Development Associates on the evolution of ICT policymaking since the mid-1990s), and also those with a more general interest in how different aspects of African societies use mobile phones in particular settings: Julie Soleil Archambault (University of Oxford) presented on 'Mobile Phones and the Transformative Powers of Information in Inhambane, Southern Mozambique', for example, and Hans Hahn (University of Frankfurt) on 'Mobile Phones and the Transformation of Society: New Forms of Criminality and the Ambivalence of 'Networks' in Burkina Faso'. The focus on mobile phones among the range of possible ICTs came as little surprise, and there was a strong interest in the good number of papers that spoke to the 'revolutionary' title of the conference: among them Chambi Chachage (Harvard University) on ICTs as new tools for citizen agency in Tanzania, and Guy Collender (London International Development Centre) on the double-edged sword of ICT in conflict situations. Discussion focussed on the use of mobile phones during elections, the reporting of human rights abuses, and on crowdsourcing during times of political unrest. Not long after the conference the 'Arab Spring' then rose in the northern reaches of the Africa, and interest in the use of social media across the continent has now exploded as academics, donors, governments, activists and the private sector are seeking to understand the consequences of vast numbers of people – some disillusioned with current politics – now having access to new sources of information and means of communication.

What was not anticipated when the broad call for papers was given was a large response from those with an interest in ICT and human mobility. The interest may have been in reply to the call in an influential overview paper to "delve deeper to explore how the utility of mobility compares to basic connectivity" (Donner 2008: 152), or it may simply have been fortunate timing, when various findings came together after the realisation that – to use Mirjam De Bruijn's title phrase from her inaugural lecture of the same year – "the telephone has grown legs" (De Bruijn 2008) and the very mobility that the mobile phone offers became a rich research field for those with various interests in developing countries. Some findings have since been reported on mobility and marginalisation in developing countries (e.g., Molony 2009), and research has been conducted on the understandings of mobile phones and distance in remote locations (e.g., De Bruijn et al 2010), but this work on the Cameroonian Grassfields is exceptionally recent in academic terms when put into the perspective of

[1] Thanks is given to Jonathan Donner and Fabien Petitcolas at Microsoft Research for their generosity that allowed for a number of postgraduate students to attend the conference.

societies that have inhabited this area of west Central Africa for millennia and who anthropologists have engaged with for little more than one hundred years.

Whether we are concerned with the Cameroonian Grassfields, the foothills of the Himalayas, inner-city São Paulo, or Upstate New York, the same holds true in terms of ICT and human mobility: humans have always been mobile, but telephony has not – and in the *longue durée* perspective of history, the advent of the telephone with legs is a very recent event anywhere in the world. Even since the widespread uptake of mobile phones in developing countries, the devices have not always been carried by their itinerant owners as they travel very locally or further afield. For more aged users in particular, but also for those travelling to areas not served by mobile coverage, a mobile phone is still sometimes regarded more as a landline that remains at home (or remains at an area of coverage) than a means of communication that an individual will always carry along with his/her keys and money. This attitude is changing as coverage becomes ever wider in developing countries, as mobile phones become more essential to the everyday lives of users, and as travellers are more able to use handsets farther and farther from home.

To again take a historical perspective, this increase in use of mobile phones and, to a lesser extent, other ICTs, is happening during what has been termed as 'the age of migration' – a time marked by a rapid increase in the rate of urbanisation in developing countries, and a growth in the number of international migrants (for which people from developing countries comprise over half the total population). As these migrants move to new locations, they frequently bring with them their mobile phones – a device that for many of the poor is the only technology, save perhaps a small radio, that they may own.

Whatever the motivation for migration – whether voluntary or involuntary – it is here that the very mobility of the mobile phone comes into its own, enabling migrants to remain in communication with existing contacts, and to communicate within new networks as they develop. 'Migrants' are understood here to be a broad group of individuals with different motivations, and can include domestic migrants within developing countries (rural-urban, urban-rural, rural-rural, urban-urban), south-south (developing country-to-developing country) migrants, south-north (developing country-to-developed country) migrants, and north-north (developed country-to-developed country) migrants.

This special edition includes additional papers to those presented at the Edinburgh conference on ICT in Africa, and follows a call for contributions to widen the appeal for readers interested in cases of ICT and mobility in other parts of the world. The location of the "main city in an emerging economy" covered in the paper by Vanessa Frias-Martinez et al. cannot be revealed due to company policy, but their mathematical model is revealing. The authors analyze the relationship between socio-economic levels and human mobility by characterizing human mobility with a set of variables measured from the information contained in mobile phone call data records (managed at an aggregated level and encrypted to preserve privacy), and present a model that approximately computes socio-economic levels based on human mobility variables. They argue that this is useful because it allows for mobility data to be retrieved objectively without the need for interviews, which is important in the many cases where in developing countries socio-economic data is not readily available, and

where estimating the actual socio-economic levels can be difficult and/or expensive. While they acknowledge that the findings themselves cannot be extended to other locations, they do point to the how the methodology could be used to replicate the analysis elsewhere in contributing to findings relevant for a variety of areas in policy design for emerging economies, ranging from transport planning to virus spreading containment.

The motivation for Josh Blumenstock's paper is how ICTs can help researchers and policymakers better measure and evaluate processes of development, rather than assess the causal impact of the interventions themselves. He provides a new quantitative perspective on certain patterns of internal migration in Rwanda that are unobservable using standard techniques. Despite the best intentions and efforts of policymakers, it is argued, many of the indicators of development are still rather blunt instruments lacking in subtlety and resolution. This is suggested in the empirical analysis, which reveals very high levels of temporary and circular migration in Rwanda – consistent with the qualitative literature, but not the documented quantitative techniques. The paper introduces a new quantitative measure of inferred mobility that is used to compute rates of temporary and circular migration which also uses call data records. The researchers were able to access the basic demographic information of a large sample (901) of individuals, as well as the individuals' rough pattern of movement over a four-year period. As with Frias-Martinez et al., the data can be used to track mobility and migration, but it is suggested that similar methods could also be used to trace the spread of diseases, measure patterns of information diffusion, or analyze the impact of mobile-based services. The discussion on ethical use of the data is welcome, and it is acknowledged that "[h]aving a detailed repository of information on an individual, with a time-stamped history of visited locations, is a delicate matter in any context." It is suggested how these data can be used to improve development policy, but the author is aware that one "cannot reject the possibility that derivative methods would be used for less desirable purposes."

Further north on the continent, Max Schaub's paper explores the possible links between the growth in mobile phone coverage in West and Northern Africa and the parallel expansion of increased attempts by Africans to migrate overland to Europe. The fieldwork was conducted in Morocco, largely among groups of Congolese men undertaking trans-Saharan migration journeys. It is shown that the expansion of the communication infrastructure is only one of several factors that have turned the region into a more "transitable" space, and that the use of mobile phones is central to the migration process: migrants are draw on the unprecedented accessibility of contacts equipped with mobile phones to tie together new, geographically expansive networks. While assisting the networks of migrants and their "helpers" in internal coordination, the paper also shows that communication technology is adopted by state authorities to control and curb migration – a potential exploitation of mobile phone-generated information that the acquistion of call data records could allow for, among other uses and abuses.

The paper by Gina Porter et al. also touches on the potential for control, albeit closer to home. The researchers explore the connections between young people's mobile phone usage, virtual and physical mobility and the broader implications for social change. One finding is that the virtual mobility offered by the mobile phone has critical value to young people as a means to helping to leapfrog some considerable

mobility constraints owing to parental and village surveillance, and they suggest that this has gendered and generational impacts. The research covers young people across 24 sites in Ghana, Malawi and South Africa, and observes different usage patterns in different locational contexts. The approach is both quantitative and qualitative, including – alongside the more familiar methods of data collection – the novel use of essay competitions, and some peer research undertaken by young students. Using this local data in the early stages of the research, the authors are able to argue that their findings also have implications for the potential for improved rural/agricultural viability in the longer term, versus the thesis that mobile phones will increase youth urban migration.

Turning to the city, and to another continent, Nimmi Rangaswamy and Sumitra Nair consider PC-aided micro-enterprises run by families of migrant origin in a suburban slum in metropolitan Mumbai, India. What differentiates these spaces from the more acknowledged ICTD initiatives elsewhere, they argue, is that they are geared towards servicing a sector of consumers ignored by the government and donors. The authors describe the organic socio-economic business processes by which digital hardware, software and related skills are procured, learnt and disbursed via informal and peer-to-peer networking, training and servicing, in turn ensuring that ICTs are affordable, accessible, usable and servicable to populations marginal to mainstream and global ICT markets. This holds the slum in a different light, as a site for business incubation through routes of informal acquisition of socio-business capital. The slum a socio-business context, argue Rangaswamy and Nair, is both a node in the larger non-formal network of PC-aided businesses, as well as a site aspiring for and staking claims towards the larger formal service economy of the city – allowing for upward socio-economic mobility.

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